

WHAT IS CLAIMED IS:

- 1 1. A method for identifying a ligand for DEC, wherein DEC is an integral  
2 membrane protein expressed by dendritic cells, thymic epithelial cells, lung  
3 epithelial cells, small intestine epithelial cells, and brain capillaries, having an  
4 apparent molecular weight of 205 kDa by polyacrylamide gel electrophoresis, and  
5 comprising ten lectin domains, a transmembrane domain, and a short cytoplasmic  
6 tail containing a coated pit localization consensus sequence, which method  
7 comprises:
- 8 a) contacting a protein comprising at least one DEC lectin domain with
  - 9 a candidate ligand; and
  - 10 b) detecting binding of the candidate ligand with the DEC lectin
  - 11 domain;
- 12 wherein detection of binding of the candidate ligand and the DEC lectin domain  
13 indicates that the ligand candidate is a ligand for DEC.
- 1 2. The method according to claim 1, wherein the ligand is a saccharide.
- 1 3. The method according to claim 1, wherein the protein comprising at least  
2 one DEC lectin domain is expressed by cells as an integral membrane protein, and  
3 the candidate ligand is labeled, such that binding of the candidate ligand with the  
4 DEC lectin domain is detected by detecting association of the label with the cells.
- 1 4. The method according to claim 1, wherein the protein comprising at least  
2 one DEC lectin domain is solubilized, and the candidate ligand is irreversibly  
3 associated with a solid phase support, such that binding of the candidate ligand  
4 with the DEC lectin domain is detected by detecting binding of the protein with the  
5 solid phase support.
- 1 5. The method according to claim 1, wherein the protein comprising at least  
2 one DEC lectin domain is irreversibly associated with a solid phase support, and

3 the candidate ligand is labeled, such that binding of the candidate ligand with the  
4 DEC lectin domain is detected by detecting association of label with the solid  
5 phase support.

1 6. The method according to Claim 1 wherein the protein comprising at least  
2 one DEC lectin domain is a truncated DEC protein.

1 7. The method according to Claim 1 wherein the protein comprising at least  
2 one DEC lectin domain is a full length DEC protein.

1 8. Human DEC-205, wherein the human DEC-205 is an integral membrane  
2 protein expressed by dendritic cells, having an apparent molecular weight of 205  
3 kDa by polyacrylamide gel electrophoresis, comprising ten lectin domains, a  
4 transmembrane domain, and a short cytoplasmic tail containing a coated pit  
5 localization consensus sequence, having a carboxyl-terminal sequence  
6 RHRLHLAGFSSVRYAQGVNEDEIMLPFHD (SEQ ID NO: 1), and  
7 characterized by binding to a rabbit polyclonal antibody raised against full length  
8 murine DEC-205, but not reacting with monoclonal antibody NLDC-145.

1 9. A nucleic acid encoding at least a portion of human DEC-205 of claim 8,  
2 which nucleic acid is characterized by having at least fifteen base pairs.

1 10. The nucleic acid of claim 9 which encodes a lectin binding domain.

1 11. A nucleic acid encoding at least a portion of a DEC protein, wherein the  
2 DEC protein is an integral membrane protein expressed by dendritic cells, having  
3 an apparent molecular weight of 205 kDa by polyacrylamide gel electrophoresis,  
4 and comprising ten lectin domains, a transmembrane domain, and a short  
5 cytoplasmic tail containing a coated pit localization consensus sequence, which  
6 nucleic acid comprises at least fifteen base pairs.

- 1 12. The nucleic acid of claim 11 which encodes a human DEC protein.
- 1 13. The nucleic acid of claim 11 which encodes a murine DEC protein.
- 1 14. An expression vector comprising the nucleic acid of claim 11, wherein the  
2 nucleic acid is a DNA molecule encoding at least a lectin domain of DEC,  
3 operatively associated with an expression control sequence.
- 1 15. A recombinant host cell comprising the expression vector of claim 14.
- 1 16. The recombinant host cell of claim 15 which is a mammalian cell selected  
2 from the group consisting of a Chinese hamster ovary cell, an African Green  
3 Monkey COS cell, a Madin-Darby canine kidney cell, and an NIH-3T3 fibroblast  
4 cell.
- 1 17. The recombinant host cell of claim 16, wherein the DNA molecule encodes  
2 a full length DEC protein.
- 1 18. The recombinant host cell of claim 16, wherein the DNA molecule encodes  
2 a human DEC protein.
- 1 19. An antibody reactive with a human DEC-205 protein, which human DEC-  
2 205 is an integral membrane protein expressed by dendritic cells, having an  
3 apparent molecular weight of 205 kDa by polyacrylamide gel electrophoresis,  
4 comprising ten lectin domains, a transmembrane domain, and a short cytoplasmic  
5 tail containing a coated pit localization consensus sequence, having a carboxyl-  
6 terminal sequence RHRLHLAGFSSVRYAQGVNEDEIMLPSFHD (SEQ ID NO:  
7 ), and characterized by binding to a rabbit polyclonal antibody raised against full  
8 length murine DEC-205, but not reacting with monoclonal antibody NLDC-145.
- 1 20. The antibody of claim 19 which is a monoclonal antibody.

1 21. The antibody of claim 19 which is a polyclonal antibody.

1 22. A pharmaceutical composition comprising a molecule targeted to a tissue  
2 selected from the group consisting of pulmonary circulation, intestinal circulation,  
3 pulmonary airways, lumen of the small intestine, dendritic cells in the skin and T  
4 cell areas of lymphoid organs, thymus, and brain, which molecule is conjugated to  
5 a DEC-ligand, which DEC-ligand is selected from the group consisting of a  
6 carbohydrate that binds DEC and an anti-DEC antibody, and a pharmaceutically  
7 acceptable carrier.

1 23. The pharmaceutical composition of claim 22, wherein the molecule is  
2 selected from the group consisting of an anti-cancer drug, an anti-viral drug, an  
3 antibiotic, an anti-parasitic drug, and an anti-inflammatory drug.

1 24. A recombinant vector for introduction of a gene into cells selected from the  
2 group consisting of dendritic cells, thymic epithelial cells, lung epithelial cells,  
3 small intestine epithelial cells, and brain capillary cells comprising a DNA vector  
4 conjugated to a DEC-ligand, wherein the DEC-ligand is selected from the group  
5 consisting of a carbohydrate that binds DEC and an anti-DEC antibody.

1 25. The recombinant vector of claim 24 wherein the DNA vector is selected  
2 from the group consisting of a viral vector, a liposome vector, and a naked DNA  
3 vector.

1 26. A vaccine comprising an antigen from a pathogen conjugated to a DEC-  
2 ligand, wherein the DEC-ligand is selected from the group consisting of a  
3 carbohydrate that binds DEC and an anti-DEC antibody, and an immune stimulator.

1 27. The vaccine of claim 26, wherein the pathogen is selected from the group  
2 consisting of a virus, a bacterium, a parasite, and a tumor.

1 28. The vaccine of claim 26, wherein the immune stimulator is selected from  
2 the group consisting of a cytokine, a lymphokine, and an adjuvant.

1 29. A composition to induce immune suppression comprising an autoantigen or  
2 an allergen conjugated to a DEC-ligand, wherein the DEC ligand is selected from  
3 the group consisting of a carbohydrate that binds DEC and an anti-DEC antibody,  
4 with the proviso that the composition lack immune stimulatory agents.

1 30. The composition of claim 29, wherein the autoantigen is selected from the  
2 group consisting of myelin basic protein, collagen or a fragment thereof, DNA, a  
3 nuclear protein, a nucleolar protein, a mitochondrial protein, and a pancreatic  $\beta$ -cell  
4 protein.